

CLAIMS

1. In a method of detecting a relative position of an exposure mask and an object to be exposed, wherein exposure is carried out while the exposure mask having a light blocking film formed at a membrane portion thereof is closely contacted to the object to be exposed and light from a light source is projected to the object to be exposed, through the exposure mask, and wherein the relative position of the exposure mask and the object to be exposed is to be detected prior to the exposure, characterized by the steps of:

preparing the exposure mask having a light blocking film provided on a base material constituting the membrane portion and having a structure for performing position detection; and flexing the membrane portion and detecting, by use of the structure, a relative position of the exposure mask and the object to be exposed, in a state in which the exposure mask is contacted to the object to be exposed.

2. In an alignment method for an exposure mask and an object to be exposed, wherein exposure is carried out while the exposure mask having a light blocking film formed at a membrane portion

thereof is closely contacted to the object to be exposed and light from a light source is projected to the object to be exposed, through the exposure mask, and wherein alignment of the exposure mask and the object to be exposed is to be carried out prior to the exposure, characterized by the steps of:

preparing the exposure mask having a light blocking film provided on a base material constituting the membrane portion and having a structure for performing position detection;

flexing the membrane portion and detecting, by use of the structure, a relative position of the exposure mask and the object to be exposed, in a state in which the exposure mask is contacted to the object to be exposed; and

aligning the exposure mask and the object to be exposed, with each other, on the basis of a result of said position detection.

3. An alignment method according to Claim 2, wherein, where a deviation with reference to a position to be exposed is detected by said position detection, the flexure of the membrane portion is removed and the exposure mask and the object to be exposed are relatively moved so as to remove the positional deviation, and subsequently,

the membrane portion is flexed again to be contacted to the object to be exposed and, in that state, the position detection is carried out, and wherein the above-described procedure is repeated
5 once or more until the deviation comes into a predetermined tolerable range for exposure precision, whereby the alignment is carried out.

4. An alignment method according to Claim
10 2, wherein the structure for performing the position detection is formed adjacent a center of the membrane or around the membrane.

5. An exposure method, characterized by
15 the steps of:
aligning an exposure mask and an object to be exposed, by use of an alignment method as recited in Claim 2; and

performing exposure by projecting light
20 from a light source to the object to be exposed, through the exposure mask, while the exposure mask is closely contacted to the object to be exposed.

6. An exposure mask having a membrane
25 portion including a flexible structure, characterized in that a light blocking film is provided on a base material constituting the

membrane portion, and that a structure for performing alignment of the object to be exposed and the exposure mask is provided at a central portion of the membrane portion or around the
5 membrane portion.

7. An exposure mask according to Claim 6, wherein the structure for performing the alignment is constituted by an opening formed in said light
10 blocking film.

8. An exposure apparatus, characterized by:

an exposure mask as recited in Claim 6;
15 a pressure adjusting device for causing flexure of a membrane portion of the mask;

a first driving device for narrowing a distance between the mask and a workpiece having an object to be exposed, applied thereto;

20 a second driving device for establishing parallelism between a mask surface of the mask and a surface of the object to be exposed;

a position detecting mechanism for
25 detecting a position to be exposed, by use of a structure for performing the alignment;

a third driving device for changing a

relative position of the mask and the workpiece
having the object to be exposed, on the basis of
information supplied from said position detecting
mechanism; and

5 an exposure light source.